



Characterization of the Thermal Behaviour of a Paraffin-based Phase Change Material

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Phase change materials (PCMs) have attracted considerable attention in the field of heat storage due to their ability to absorb and release large amounts of latent heat during phase transitions. The integration of PCMs into building materials offers promising opportunities for improving the thermal performance and energy efficiency of buildings.¹

This paper focuses on the PCM material as an advanced additive material to other building materials in energy efficient buildings. It consists of a polyurethane coating and paraffin wax filler. Thermal properties were measured by monitoring the mass change, evolved gas analysis, and the changes in heat flux (endothermic and exothermic effects) during several consecutive heating and cooling cycles. Knowing the measured thermal properties of the material is very important also from a fire safety point of view. The obtained results will help us to understand the behaviour of these materials when exposed to repetitive temperature changes or extreme temperature conditions.

Knowledge of the thermal behaviour of PCM contributes to performance optimization, material selection, system design and control, predictive modelling, and material development. This knowledge enables the effective use of PCMs in a wide range of applications that promote energy efficiency and sustainability with focus on use of fire safe materials.

Keywords: phase change materials, thermal properties, composite, building materials

Reference

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